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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,973	08/28/2003	Tsuneyasu Nohara	023971-0303	7070
22428	7590	04/22/2004	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			ESHETE, ZELALEM	
			ART UNIT	PAPER NUMBER
			3748	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

10/649,973

Applicant(s)

NOHARA ET AL.

Examiner

Zelalem Eshete

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/28/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4,8-17,21-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Morikawa (6,079,381).

Regarding claim 1: Morikawa discloses a control system for an internal combustion engine having a variable control mechanism that variably controls engine performance characteristics in accordance with an engine operating condition (see figure 1), comprising: a detecting device that detects an operating condition of the variable control mechanism and produces a signal representative thereof, and a controller that controls the operating condition of the variable control mechanism in response to the signal from the detecting device; the controller being programmed to determine whether an operation responsiveness of the variable control mechanism is lowered based on the signal from the detecting device and vary operational characteristics of the variable control mechanism when the operation responsiveness is lowered (see column 11, lines 4 to 33).

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Regarding claims 2,15: Morikawa discloses a method and a control system for an internal combustion engine having a variable valve operating mechanism capable of varying at least one of a valve lift and an operation angle of an engine valve continuously (see column 9, lines 23 to 29), comprising: a detecting device that detects an operating condition the variable valve operating mechanism and produces a signal representative thereof, and a controller that controls the operating condition of the variable valve operating mechanism in response to the signal from the detecting device; the controller being programmed to determine whether an operation responsiveness of the variable valve operating mechanism lowered based on the signal from the detecting device and vary operational characteristics of the variable valve operating mechanism when the operation responsiveness of the variable valve operating mechanism is lowered (see column 9, line 30 to column 10, line 2; column 11, lines 4 to 33).

Regarding claims 3,16: Morikawa discloses the controller is programmed to make a diagnosis of the operation responsiveness of the variable valve operating mechanism during operation of the engine (see column 9, line 30 to column 10, line 2).

Regarding claims 4,17: Morikawa discloses the controller is programmed to make a diagnosis of the operation responsiveness of the variable valve

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operating mechanism immediately after start of the engine, in that it accounts for the operating condition of the engine (see figure 2).

Regarding claim 8,21: Morikawa discloses the variable valve operating mechanism includes an actuator and a control shaft that is driven by the actuator so as to vary in a rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the controller being programmed to determine whether the operation responsiveness of the variable valve operating mechanism is lowered based on a holding energy of the actuator for holding the control shaft at a target rotational angle when a target rotational angle of the control shaft is held constant for a predetermined period of time (see column 4, lines 14 to 45).

Regarding claims 9,22: Morikawa discloses the variable valve operating mechanism includes an actuator and a control shaft that is driven the actuator so as to vary in a rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the controller being programmed to determine whether the operation responsiveness of the variable valve operating mechanism is lowered based on a delay in variation of an actual rotational angle of the control shaft in response to a variation of a target rotational angle when the target rotational angle is varied by an amount equal to or larger than a predetermined value (see figure 13).

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Regarding claims 10,23: Morikawa discloses the variable valve operating mechanism includes an actuator and a control shaft that is driven by the actuator so as to vary a rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the control system further comprising a detecting device for detecting a temperature of the actuator, the controller being programmed to determine the operation responsiveness of the variable valve operating mechanism based on the temperature of the actuator (see column 4, lines 34 to 45).

Regarding claims 11,24: Morikawa discloses a warning lamp that is turned on when a deterioration parameter indicative of a degree of deterioration of the actuator becomes larger than a predetermined value (see figure 4, numeral S209).

Regarding claim 12,25: Morikawa discloses the variable valve operating mechanism includes an actuator and a control shaft that is driven by the actuator so as to vary in a rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the controller being programmed to limit the rotational angle of the control shaft and thereby make smaller one of the valve lift and the operation angle when the operation responsiveness of the variable valve operating mechanism is lowered (see column 6, lines 23 to 63).

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Regarding claim 13,26: Morikawa discloses limitation of the rotational angle of the control shaft is attained by varying a "holding energy" of the actuator for holding the control shaft at a target rotational angle (see figure 1).

Regarding claims 14,27: Morikawa discloses the controller is programmed to generate a map for setting a rotational angle limit of the control shaft in accordance with engine speed when the operation responsiveness of the variable valve operating mechanism is lowered (see figure 11).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7,18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa in view of Adachi et al. (5,522,352).

Regarding claims 5,18: Morikawa discloses the claimed invention as recited above; however, fails to disclose the engine is of an V-type and has the variable valve operating mechanism at each of banks thereof.

However, Adachi teaches the engine is of a V-type and has the variable valve operating mechanism at each of banks thereof (see figure 1).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to extend the control strategy as taught by Morikawa to that of V-type engine at each of the banks as taught by Adachi in order to apply the control strategy to various engine types.

Regarding claims 6,19: Morikawa discloses the claimed invention as recited above, and further discloses variable valve operating mechanism includes an actuator and a control shaft that is driven by the actuator so as to vary in rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the controller being programmed to determine whether the operation responsiveness of the variable valve operating mechanism is lowered based on a difference between a target rotational angle and an actual rotational angle of the control shaft of the variable valve operating mechanism (see figures 2,4,12,13).

Regarding claims 7,20: Morikawa discloses the claimed invention as recited above, and further discloses the variable valve operating mechanism includes an actuator and a control shaft that is driven by the actuator so as to vary in a rotational angle thereof and thereby variably control one of the valve lift and the operation angle (see column 9, lines 23 to 29), the controller being programmed to determine whether the operation responsiveness of the variable valve operating mechanism is lowered based on a difference in a angular velocity of the control shaft, in that speed of change in angle of rotation ACSPD is



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calculated on a basis of transition in actual angle of rotation of the VVT as a responsiveness-detection parameter (see abstract).

### **Conclusion**

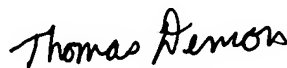
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zelalem Eshete whose telephone number is (703) 306-4239. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zelalem Eshete  
Examiner  
Art Unit 3748

Z

  
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